STUDIO
INVESTIGATIONS

CA MAU, VIETNAM

STUDIO URBAN DESIGN AND PLANNING I KULEUVEN I SPRING 2014

CA MAU, VIETNAM
H30Z6A STUDIO URBAN DESIGN AND PLANNING
MaHS-MaUSP EMU / KULeuven / SPRING 2014

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CA MAU

Ca Mau (250.000 inhabitants) is a relatively modest town situated in the southernmost part of the Mekong Delta in Vietnam. As elsewhere in Vietnam since the 1986 doi moi (open door policy), the area undergoes a radical process of modernization and urbanization. The development of new roads, new industries and new agriculture practices are profoundly transforming the territory and urban structure. Ambitious master plans are being prepared to organize the projected doubling of the city's population.

At the same time, the region is facing important environmental challenges. As one of the lowest lying areas in the world, Ca Mau is exposed to risks of rising sea level, intrusion of saline water as well as deforestation and pollution resulting from the over-intensive development of aqua farming.

In response and complement to the official master plans, the (landscape) urbanism studio Ca Mau explores alternative development scenarios integrating environmental issues. Climate change mitigation strategies such as mangrove restoration, alternative water management and more ecological productive processes are defined to simultaneously frame future urbanization. Four distinct and complementary projects focussing respectively on afforestation, agriculture, water and urban restructuring – form potential avenues for a more sustainable development of this booming and sensitive region.

COUNTERBALANCING THE DYNAMICS OF PRODUCTIVE LANDSCAPE

Interactions between intensification and picking economies.

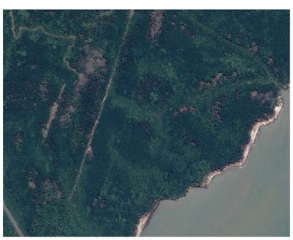
Caterina Rosso, Carmen Van Maercke

The intensive internal colonization of the territory of Ca Mau did lead to an extremely productive landscape in which settlement and productive landscape were completely interdependent. In the past decade the region seems to be in the grip of a hyper development, fueled by radical shifts from rice culture to very lucrative shrimp and fish farming. Ecological and socio-economic balances have been rapidly distorted. This short term and market driven development, which goes hand in hand with the already emerging alarming effects of climate change, implies a potential ecological disaster of unseen dimensions and economic and social catastrophe.The project proposes a new, unprecedented and challenging interplay between two contradictory development modes: an hyper intensification and upscaling of specialized aqua-, horti- and agricultural crops and an almost forgotten archetypical form of picking economy (once so common and for centuries sustainable in the South) that is reinvented and made possible through a broad renaturalization program. Afforestation and mangroving are the keys for this massive scale reclaiming for 'nature'. New precision techniques of hunting, picking and gathering of a lucrative selection of high value products (ranging from wood to sea food and fish up to medical plants) diversifies the economy. The interaction between the two economies generates a new strong and resilient landscape that allows the development of a diversified economy in an ecological healthy environment.

1 Productive artifical forest in the North of Ca Mau

2 Petro Vietnam industrial site

3 Interface between rice fields and ponds (North of Ca Mau)

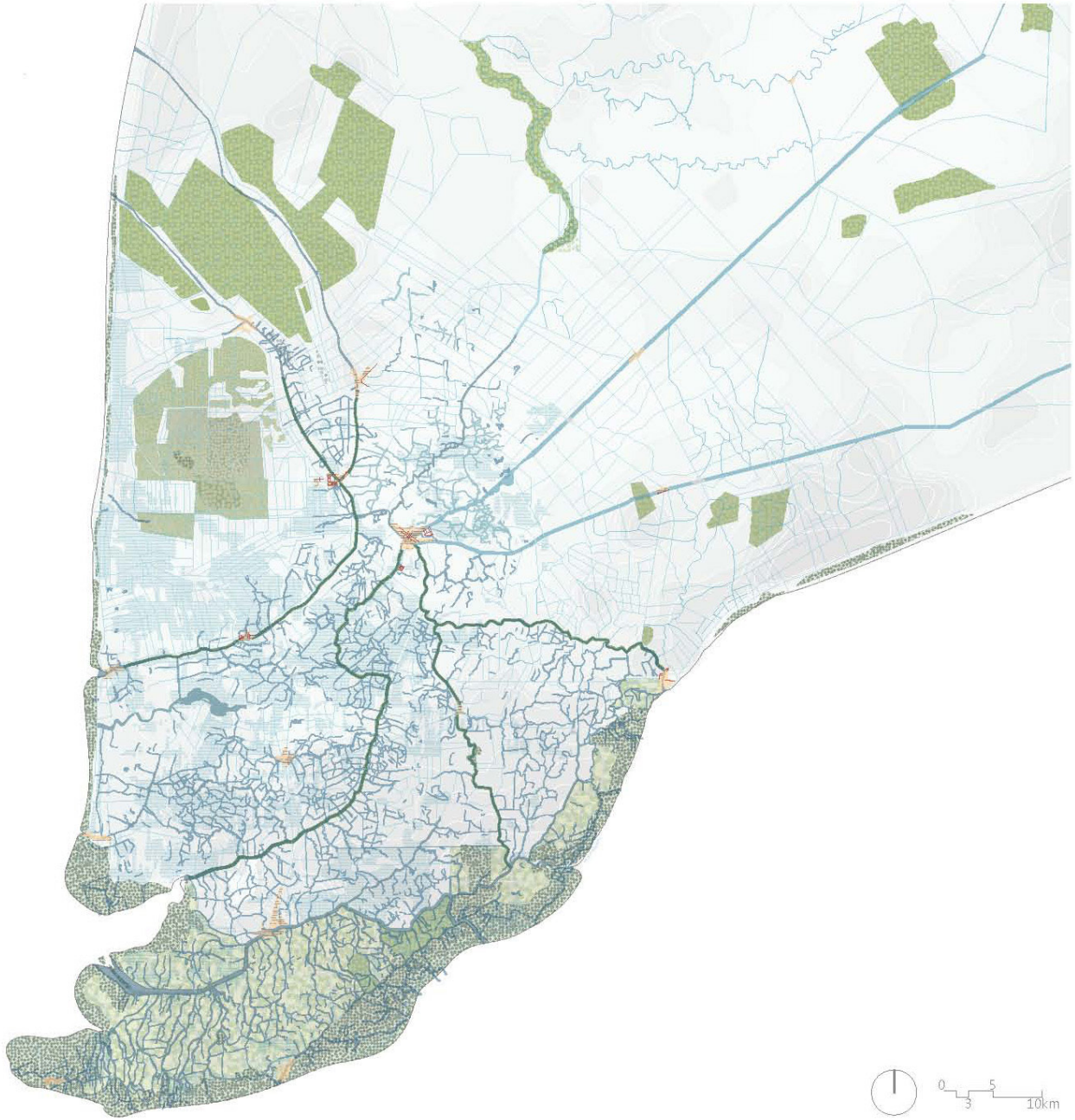


4 Mangrove forest along the coast

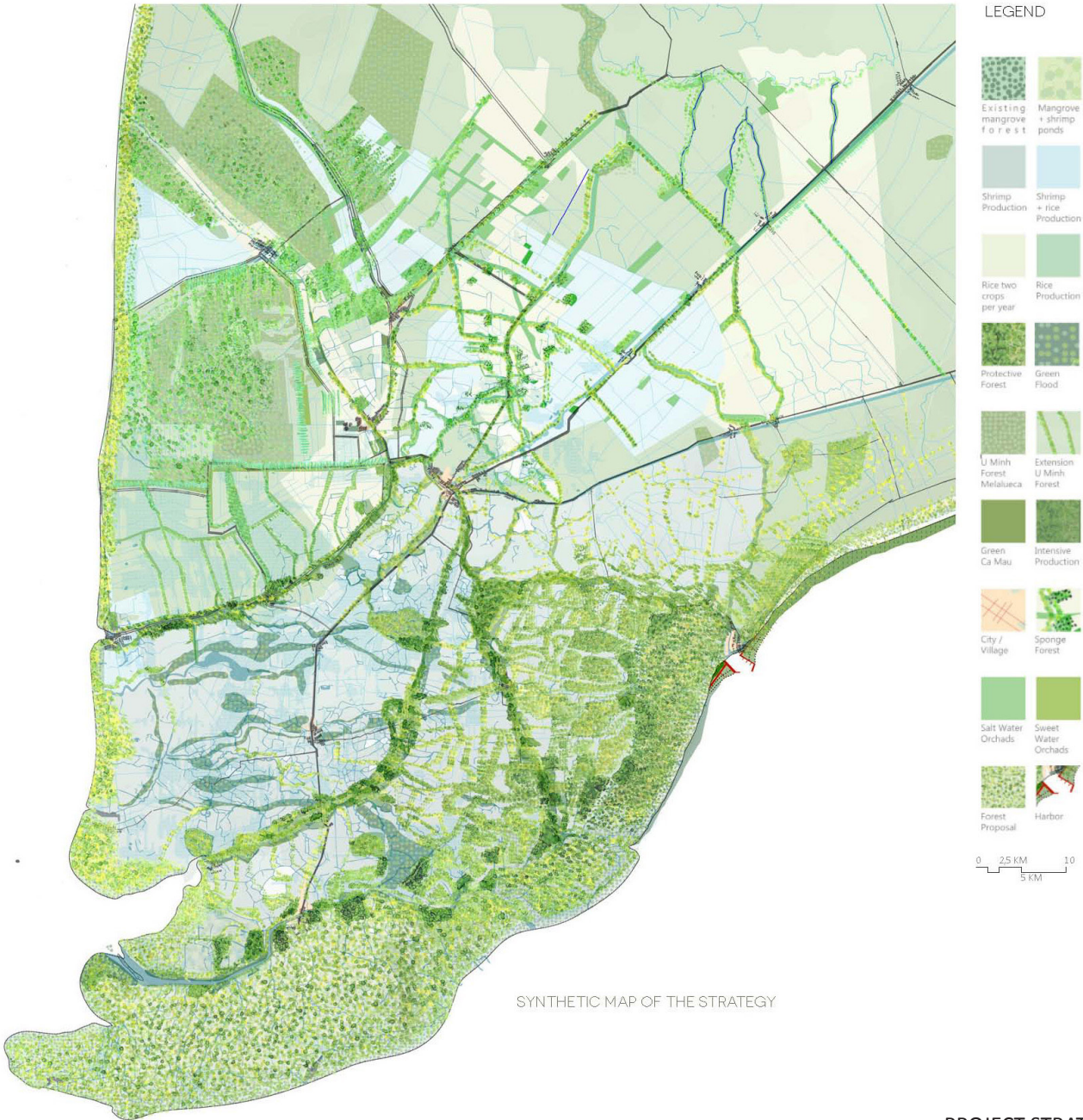
5 Paddy fields and orchards in the South of U Minh forest

6 Song Doch river_ intensive and extensive aquaculture

7 Intensive ponds and mangroves along the Eastern coast



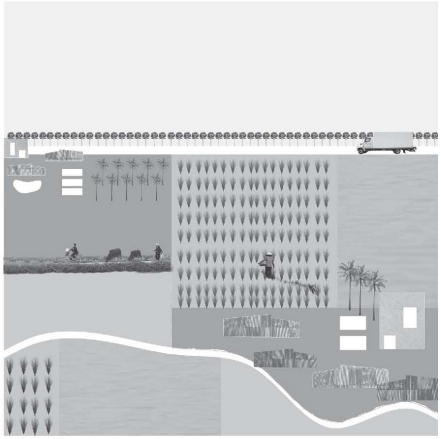
ACTUAL SITUATION



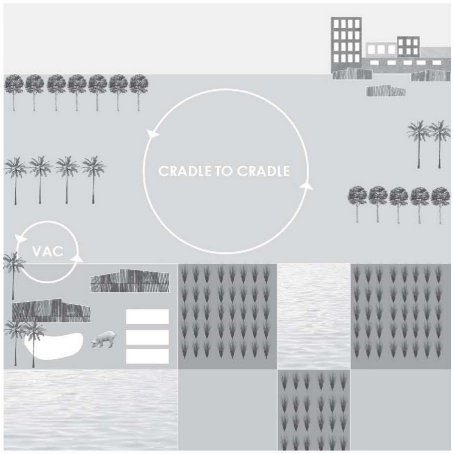
SYNTHETIC MAP OF THE STRATEGY

PROJECT STRATEGY

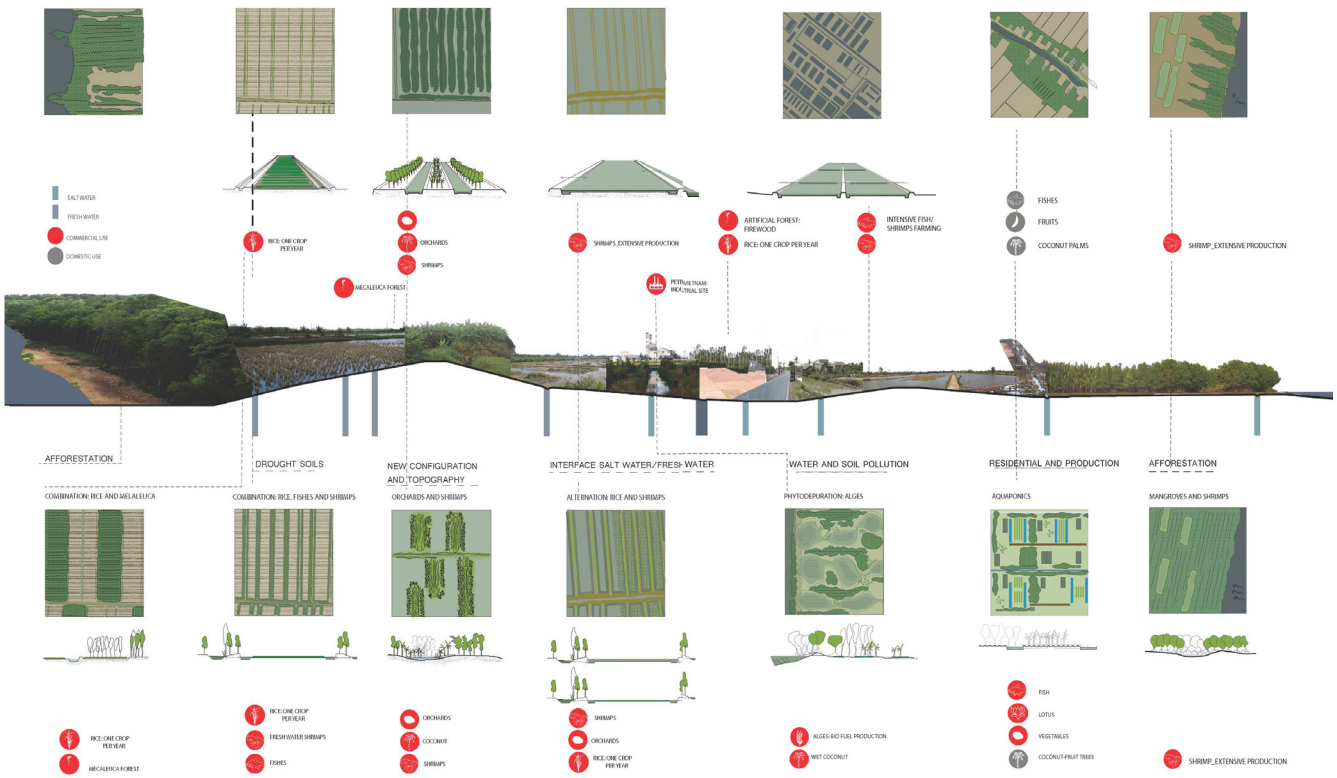
CONCEPT DIAGRAMS



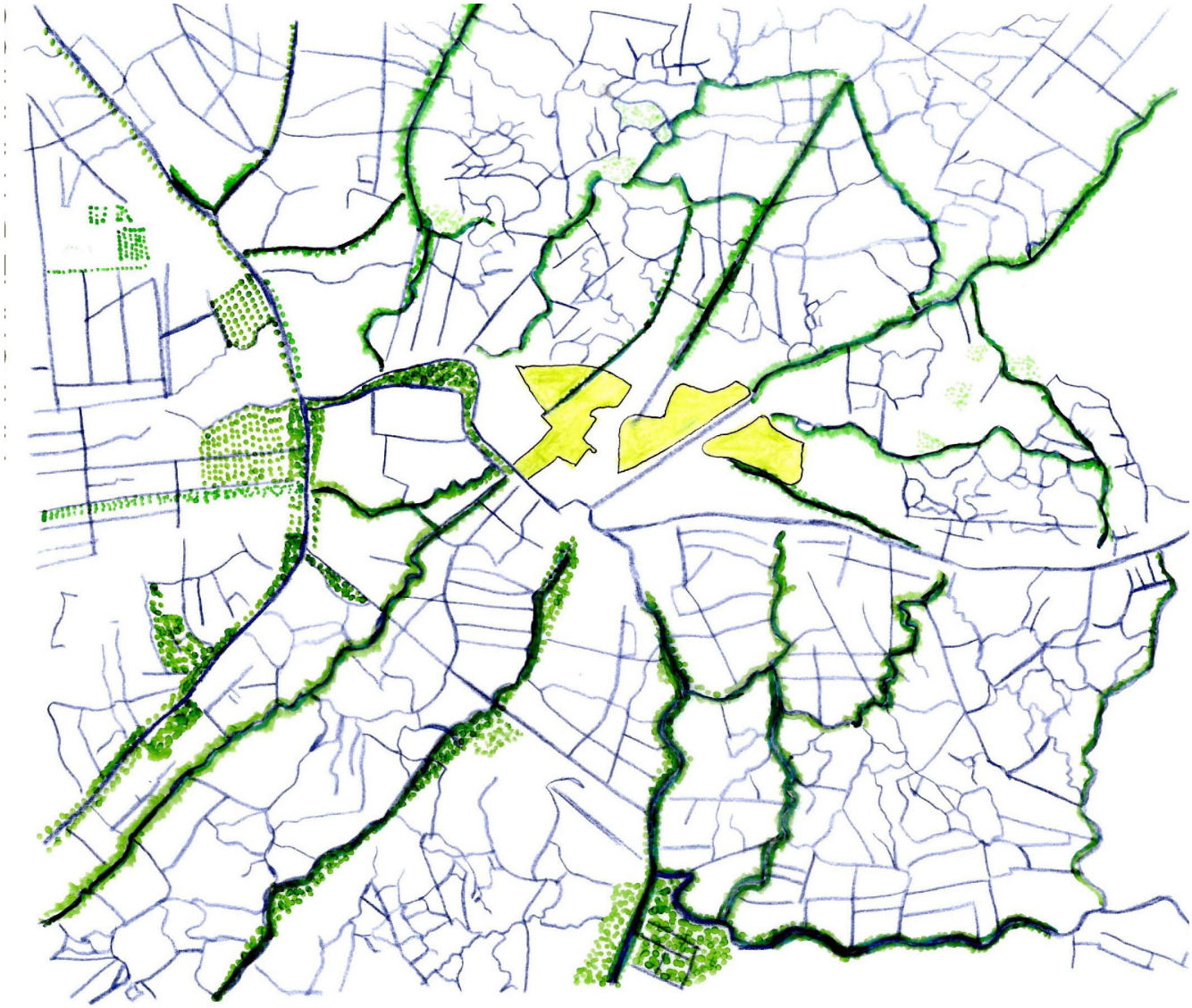
MODEL UPSCALING



MODEL CYCLES



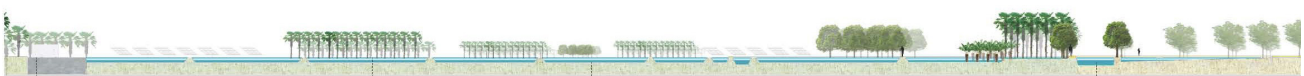
IMPLEMENTATION OF CONCEPT DIAGRAMS



NATURAL STRUCTURES ON CITY SCALE

Natural lines, derived from the peninsula scale, each with diverse character, crossing the linearity of the city.

STRATEGY



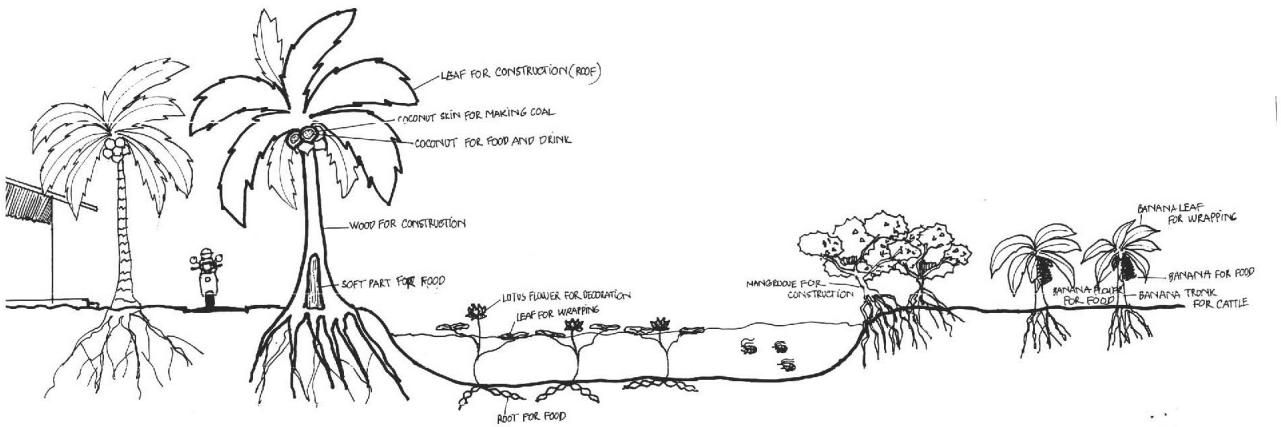
biofuel production

tree nursery

climate change research

enlarged fresh water canal

ZOOM AGROPARK



ZOOM PRODUCTIVE LANDSCAPE IN THE AGROPARK

RESILIENT WATERSCAPES

Towards a Paradigm shift in water culture

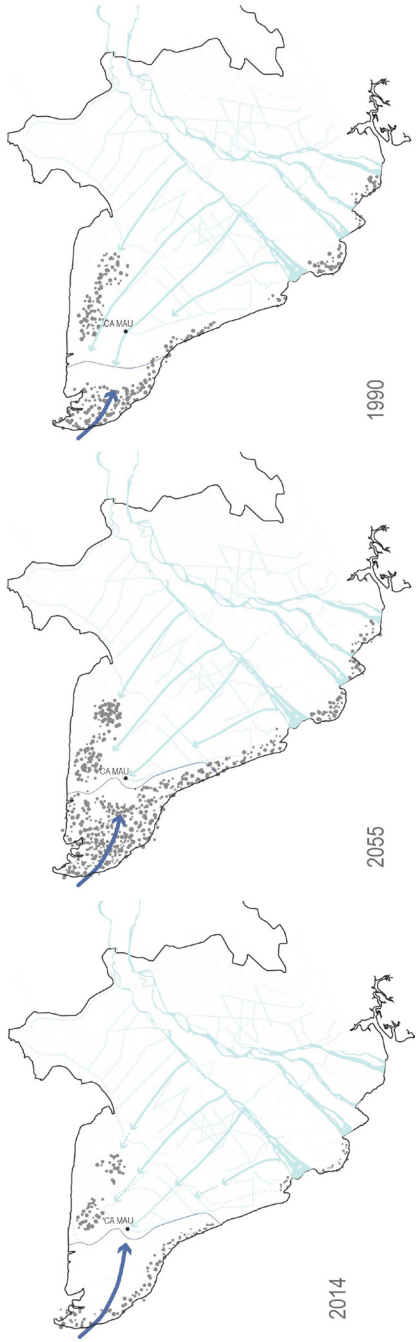
Lisa De Vos
Iris Prida

In a highly dynamic equilibrium of wet and dry, of water and land, wild and domesticated, the fertile landscape of Ca Mau has for centuries been hosting human activity in close harmony with the water. Today however, growing urbanisation, industrialisation, intensification of agri- and aquaculture together with alarmingly changing climate conditions are tipping the balance. Ca Mau has to deal with issues such as saline intrusion, freshwater shortages, massive pollution, seasonal flooding and land subsidence caused by uncontrolled extraction of ground water.

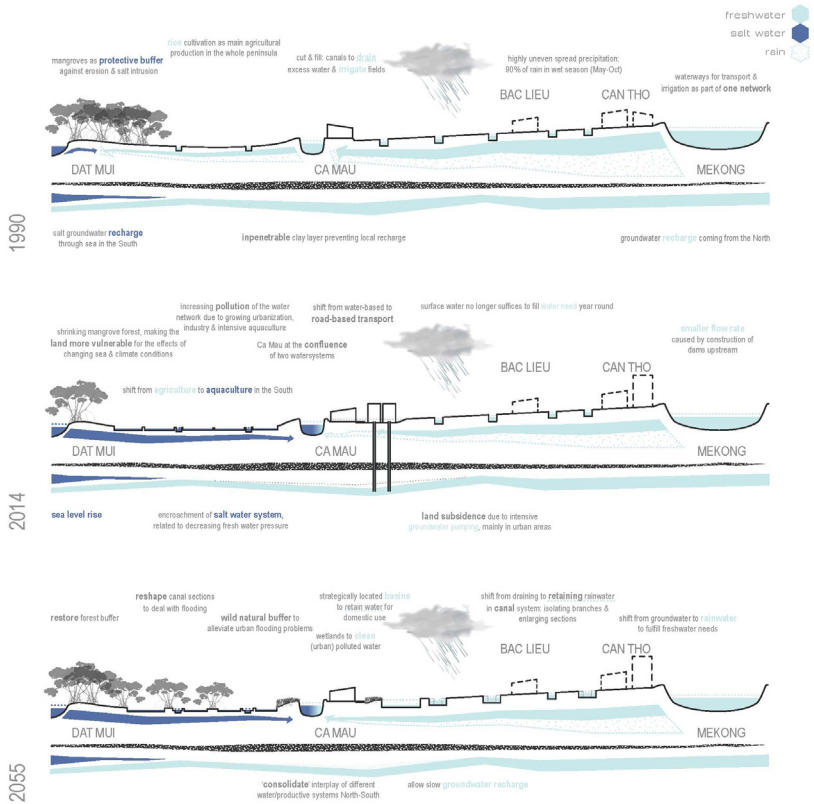
Sea level rise prompts to increasing levels of salt intrusion in the Ca Mau peninsula, going hand in hand with a production shift from freshwater-based rice cultivation to highly profitable saltwater aquaculture. At the same time, upstream building of dams decreases the amounts of freshwater that distributaries of the Mekong bring to the area, causing a turn to rapidly decreasing groundwater reserves for water provision.

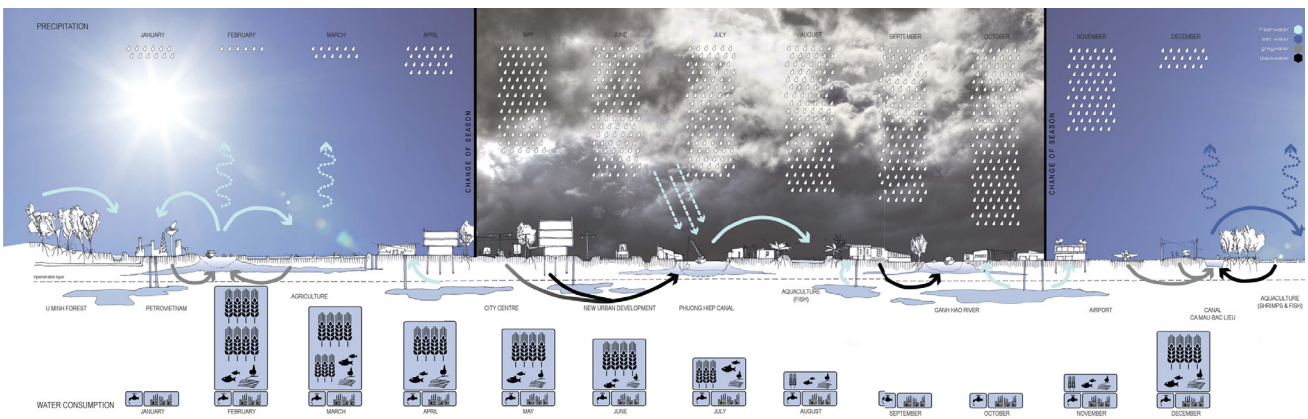
These fundamental shifts in water conditions require a drastic change in water management. In order to achieve again a resilient water cycle, it is essential to exploit new sources of freshwater and implement strategies to clean and systematically recycle urban and other wastewater. By re-orienting the water system from 'draining' to 'retaining', rain can become a major urban freshwater source. This, however, requires space and questions the capacity of the area to integrate an alternative water system. Deconstructing and reinterpretating the existing extensive and unified water network leads to the discovery of new potentialities.

Old river branches and secondary canals can be turned into water retention basins. They can also be converted into cleaning landscapes containing a sequence of low-tech solutions such as ponds, natural and constructed wetlands and aerated lagoons. These strategies are used in a set of strategic projects to generate new waterscapes of different scales (with natural water basins as logical delimitation). In a context of predicted significant population growth, the new landscapes aim at dealing with rising water levels and changed patterns of water consumption and reproduction.

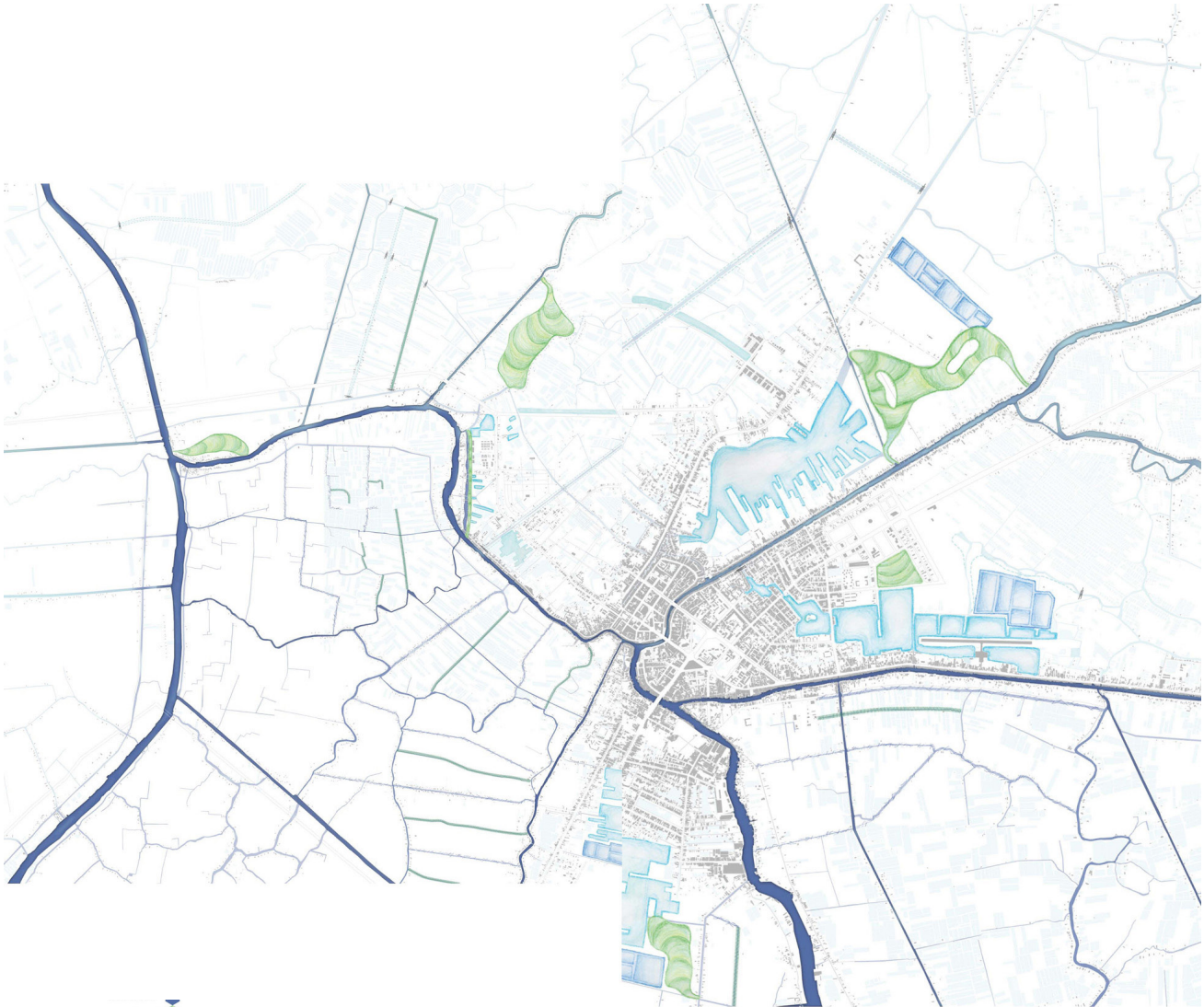


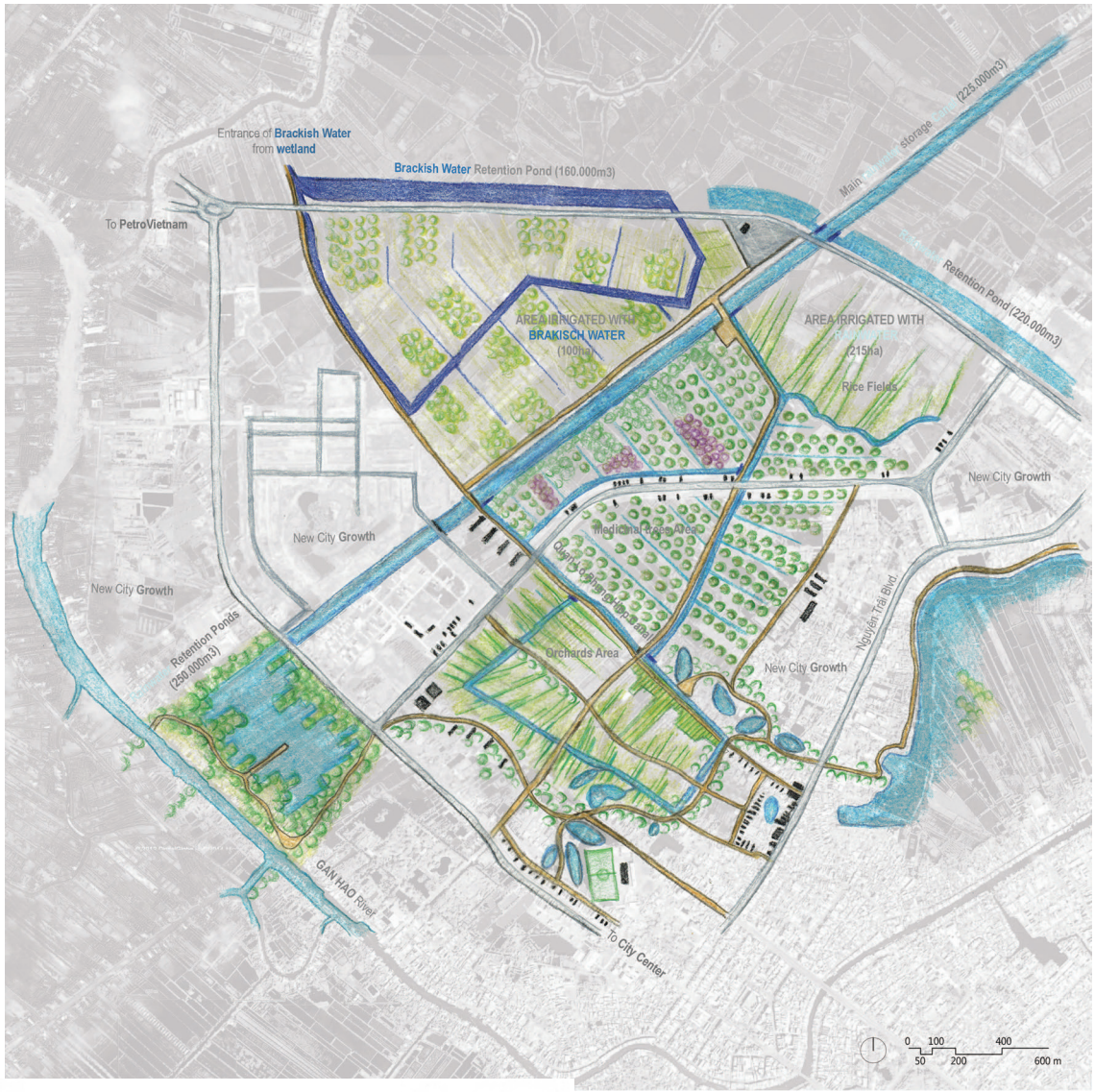
freshwater
salt water
fresh water_wet season
saline intrusion
saline intrusion_dry season
mangrove

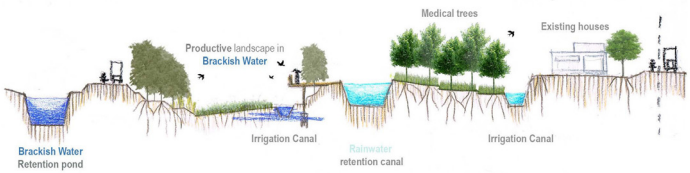




ANALYSIS OF THE WATER SYSTEM







ZOOM AGROPARK

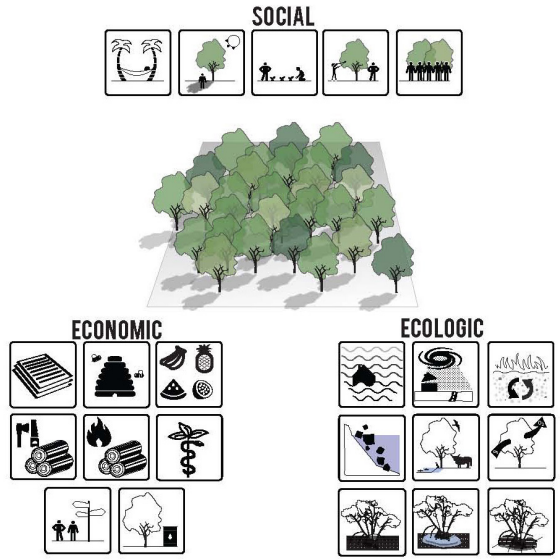
FOREST (R)EVOLUTIONS

Valentina Amaya
Carmen Briers

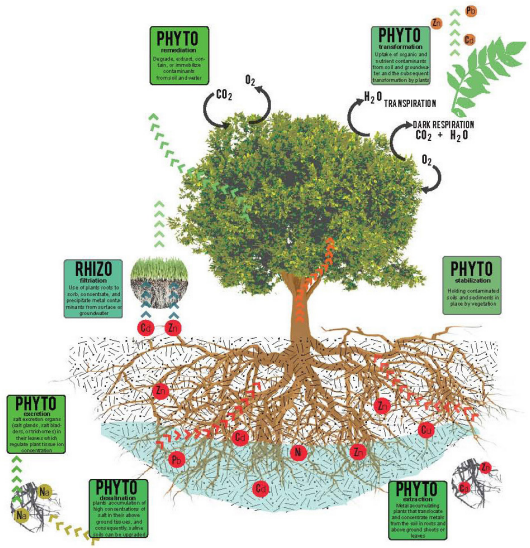
The peninsula of Cà Mau is confronted with numerous challenges, provoked by the simultaneous occurrence of a rapid rural-urban migration, drastic transformations of both the countryside and city and severe threats caused by climate change: sea level rise with its associated flooding and saltwater intrusion, coastal erosion and typhoons increasing in strength over time. The ongoing manmade processes of intensifying productive landscapes (while significantly shifting from agri- to aquaculture) in this booming region causes dramatic deforestation and heavy damage to its valuable ecosystems. The project addresses these critical with a landscape urbanism approach. Strategies, anchored within the dynamic landscape, can steer the future urbanisation that it embeds. These strategies simultaneously reproduce the peninsula as a whole – and more specifically the city of Cà Mau – a more resilient region/city? This project addresses more particularly the potential of afforestation to find an alternative response to these issues.

The peninsula of Cà Mau hosts multiple (predominantly wetland ecologies) landscape structures such as mangroves, lakes, creeks, floodplains and estuaries and coastal structures. Population growth and changing, or even shifting production practices structurally degrades these ecologies. The survival of native flora and fauna species is increasingly endangered, while intensified and upscaled, monocultural aqua- and agriculture increasingly destroy the environment. The afforestation strategies of “Forest (r)evolutions” aim to massively recover and make robust the mentioned wetland ecologies. The recovery of the former diversity in ecosystems is enhanced by the introduction of a variety of appropriate tree species that support fresh, brackish and saltwater habitats.

The massive afforestation and installation of marshes catalyses natural processes that generate the resilience is required to deal with effects of climate change. Buffers for controlled flooding, inducing processes of phytoremediation, etc. result from this afforestation programs that simultaneously host new economies (shrimp-mangrove farming, agroforestry, etc.) that diversify the currently vulnerable monocultures. Forests over time naturally built land(hights). Mangroves evidence this spectacularly. As such the afforestation program of Cà Mau -one of the topographically lowest regions worldwide, can naturally raise and prepare land for potential future urbanization, while for now it restores the intensive relationship between city and nature and reinstalls the forest as a self renewable resource that can embed and support new types of sustainable economy.



Forest as catalysor of economic, social and ecologic dynamics

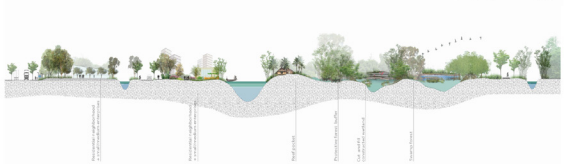


Healing the damaged landscape through remediation capacities of nature itself

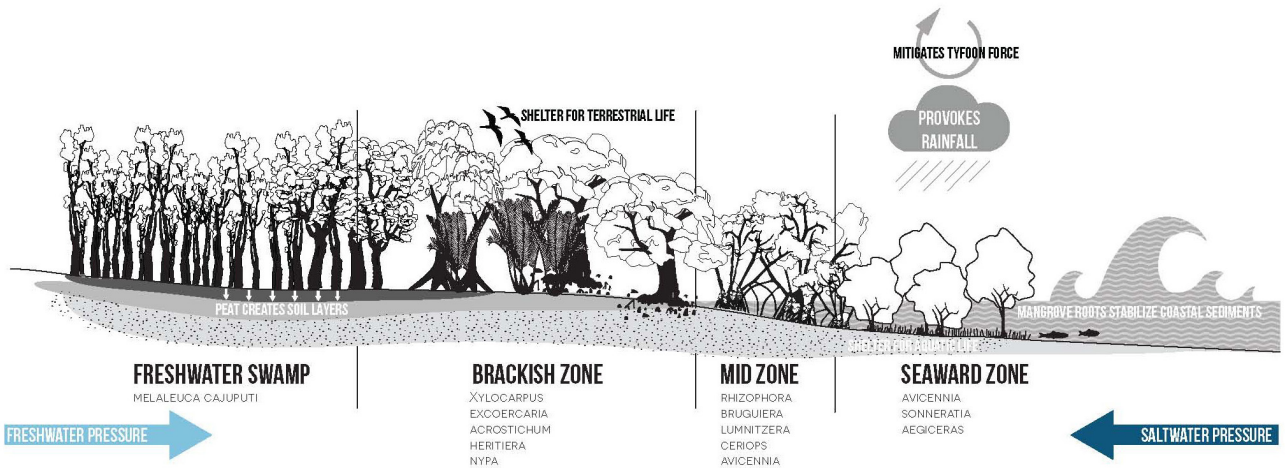
AFFORESTATION STRATEGY

Existing situation

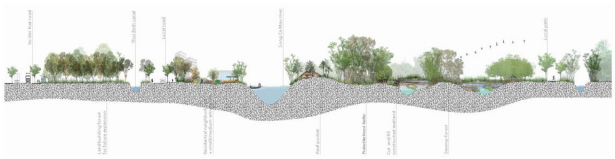
Wet season: pockets of safe higher land float like islands in the wetland



IMPACT IN THE DRY AND WET SEASON



Dry season



INTERTWINED CIVIC SPINE

A SPATIAL ARMATURE FOR URBAN GROWTH

Francesca Cocchiara

Ana Marquina

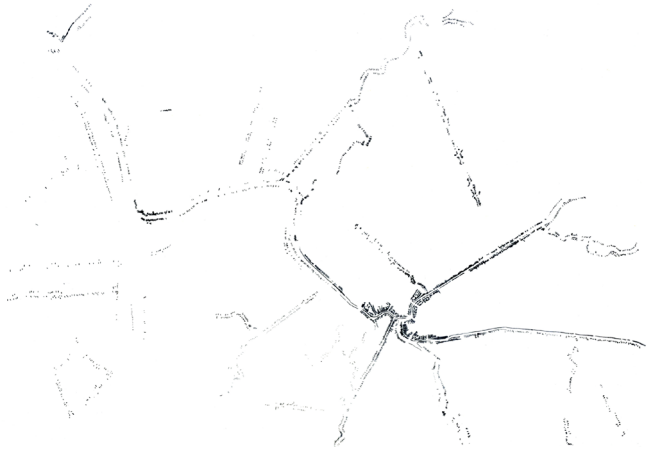
THE CITY OF CÀ MAU, presently 250.000 inhabitants, is about to double it's population in the near future, while the region simultaneously faces dramatic environmental challenges. To cope with the rapid expansion and to address the effects of climate change, the project of civic spine defines a spatial armature on which the development of the city can be anchored, while incorporating the logics of water, road structures and the newly, now peripheral, built spaces.

THE PROJECT BEGINS with the very specific water-based identity of Cà Mau. Currently the waterfront – at the origin and identity of the city- is invaded by informal housing. The project reclaims this neglected backside and turns this majestic riverside into a renewed front, for which a set of new profiles for embankments are proposed. Functioning as flood protection barriers, they host public and collective programs and support new and denser housing. A continuous public space is reclaimed along the water, it enlivens a varied waterfront that is also extended along the existing perpendicular fingers towards the city center.

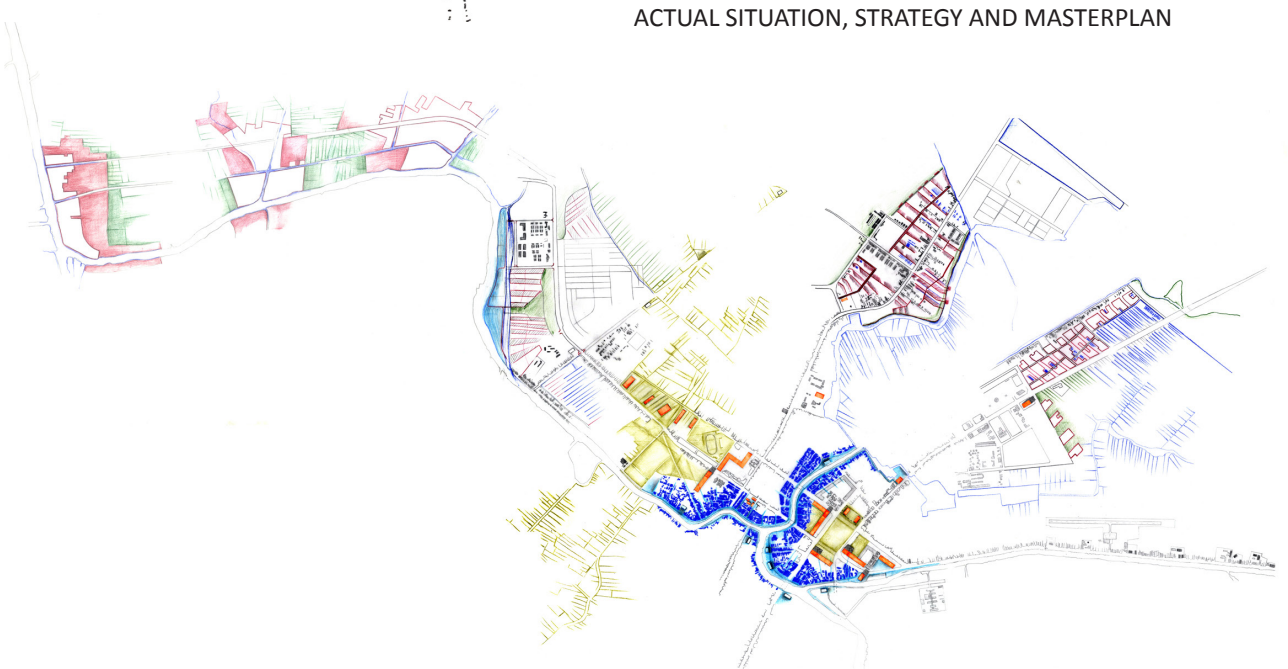
THE PROJECT RECOGNIZES the importance of the ladder figure generated by the boulevards in the core of the city, that extends over more then 15 km from Petro Vietnam until the airport. Historically, the ladder figure hosts the heart of administrative and institutional programs, however, the ongoing up-scaling of Cà Mau goes hand in hand with a redistribution of renewed centralities in outer urban areas. Thus, the project makes use of the vacancies in the center to reorganizes this emblematic space as, the only, polyvalent centrality. The rhythm of built and un-built offers space for public activities and generates dense green spaces.

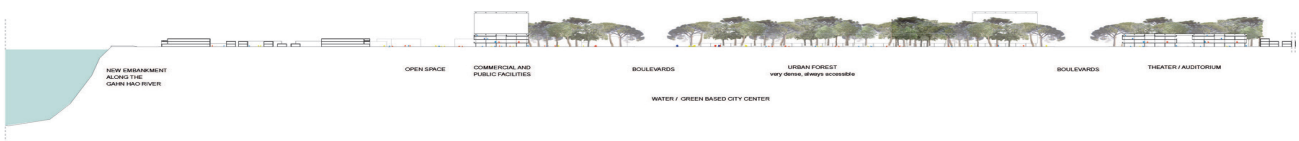
THE PROJECT FINALLY INTEGRATES the new enclaves of urbanization found along the major connection roads going north and west. Currently isolated and mono-functional, the enclaves are re-configured as gates to the city by means of new urban quarters that are anchored to them and as well being linked back into the city center and waterfront via the road spines.

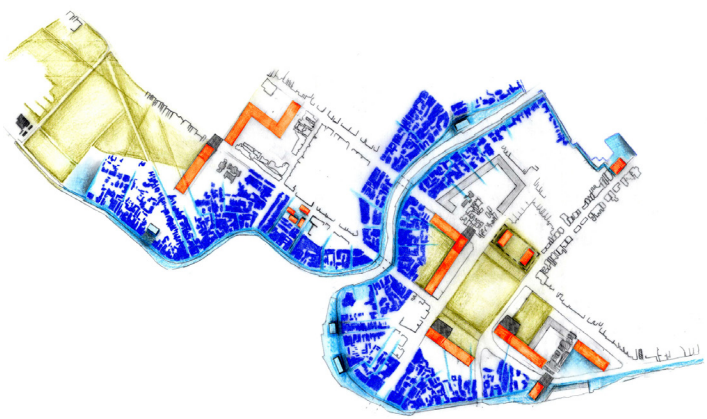
EACH OF THE THREE FIGURES – waterfront, ladder and gates - realizes ecological, flood protection and urban ambitions. The assemblage of figures becomes a legible armature that steers the future development of the city, while inducing a new civic system. The overlap of the figures aims to generate an urbanity that transcends the singularity of a provincial road and/or river town.

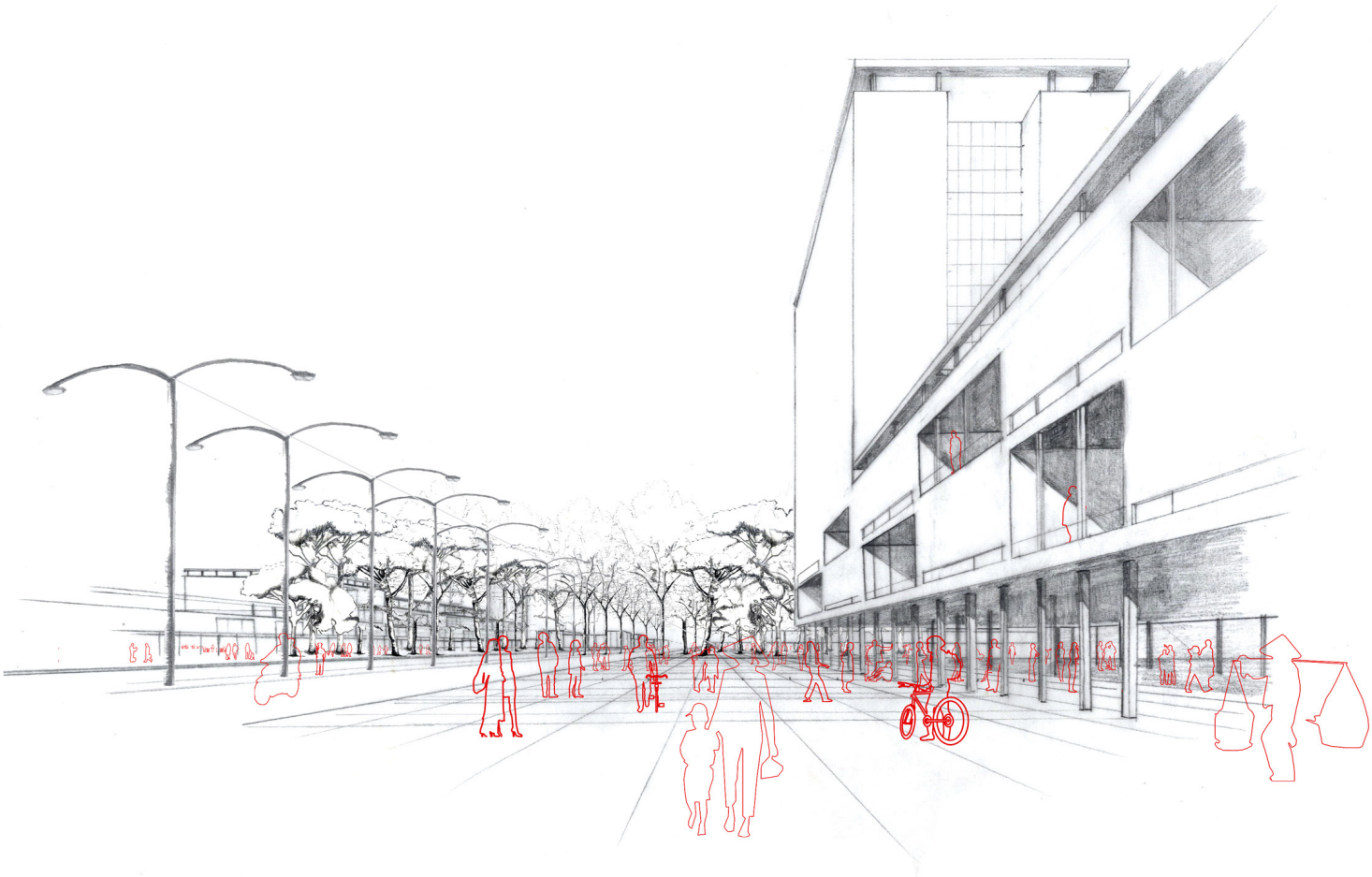


ACTUAL SITUATION, STRATEGY AND MASTERPLAN

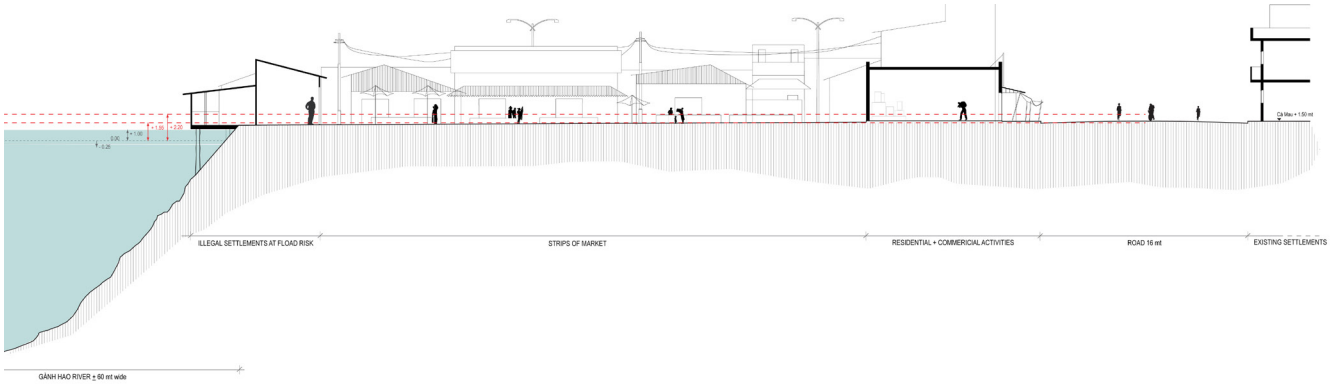


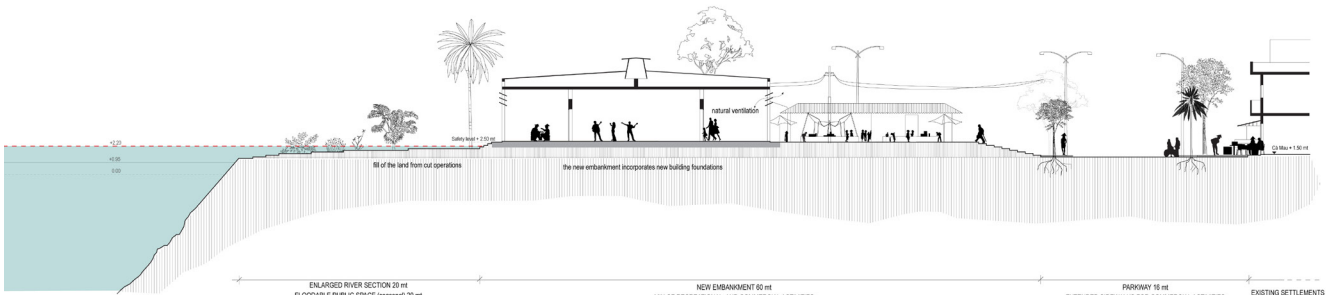


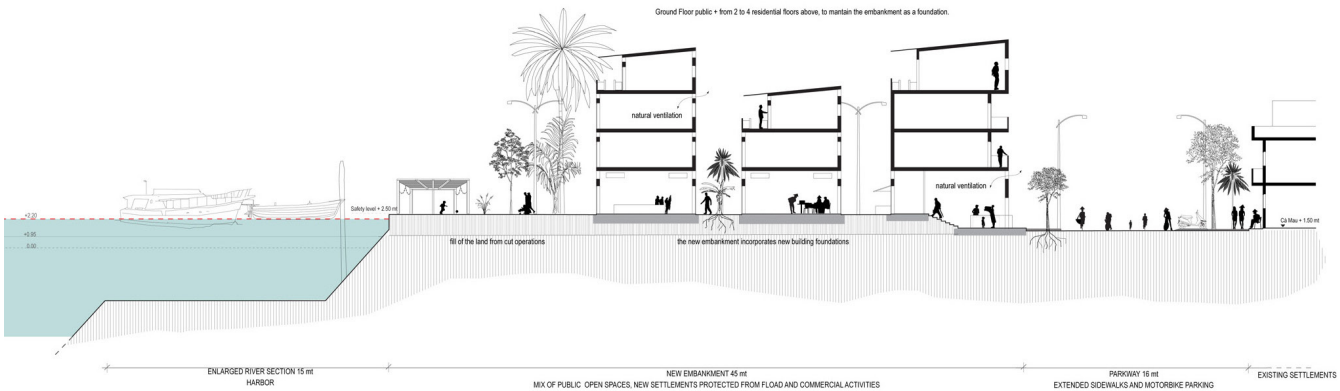


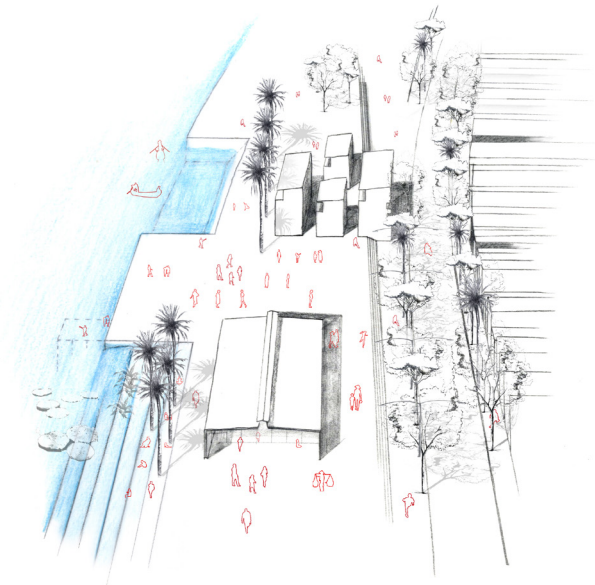


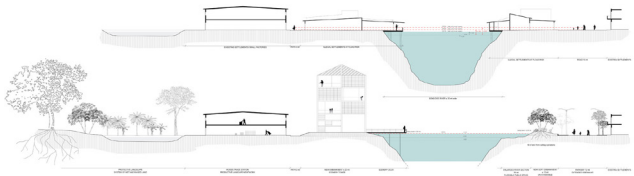
ZOOM ON THE CIVIC SPINE IN THE CENTRE

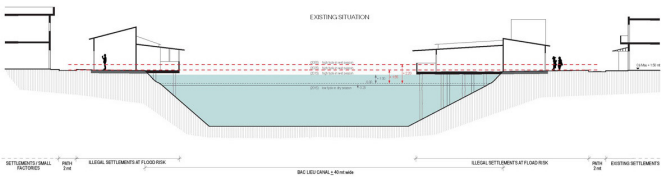


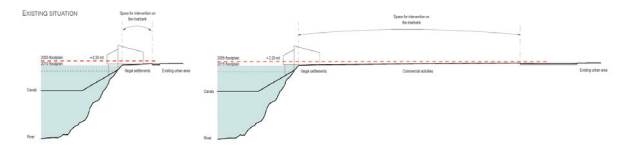


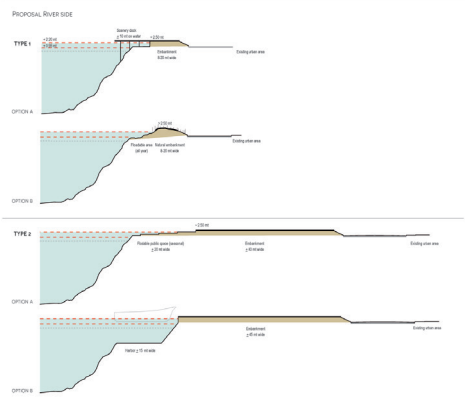


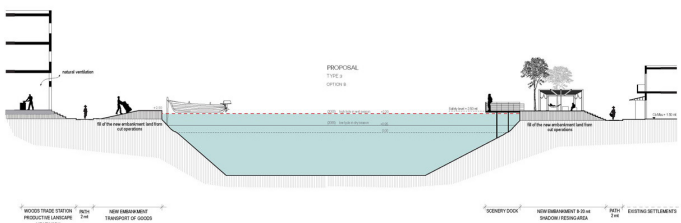










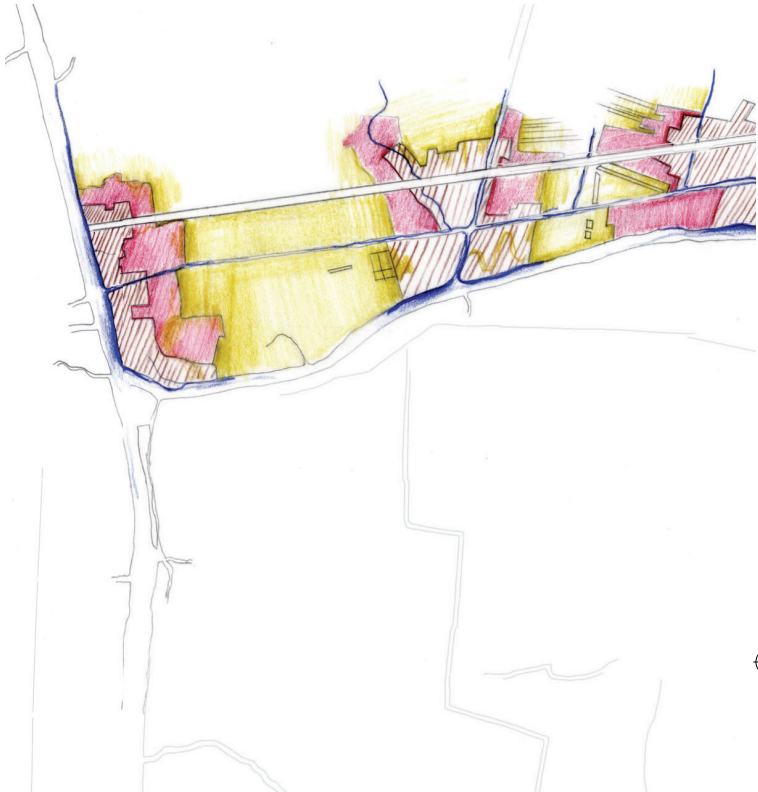


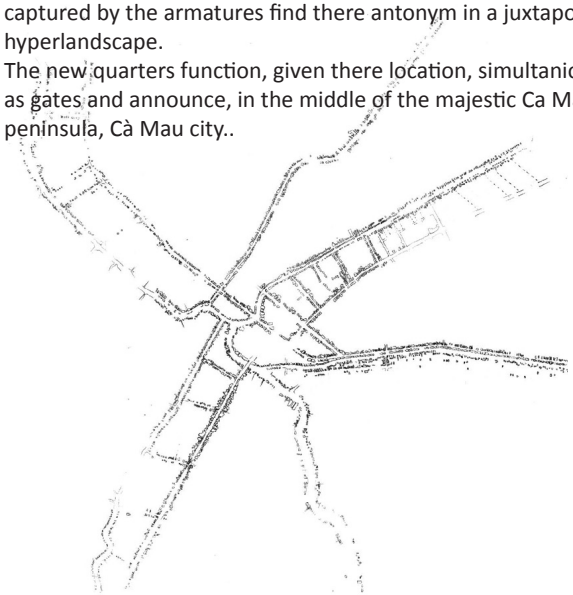
SECTIONS OF THE CIVIC SPINE IN RELATION TO THE WATER BODIES

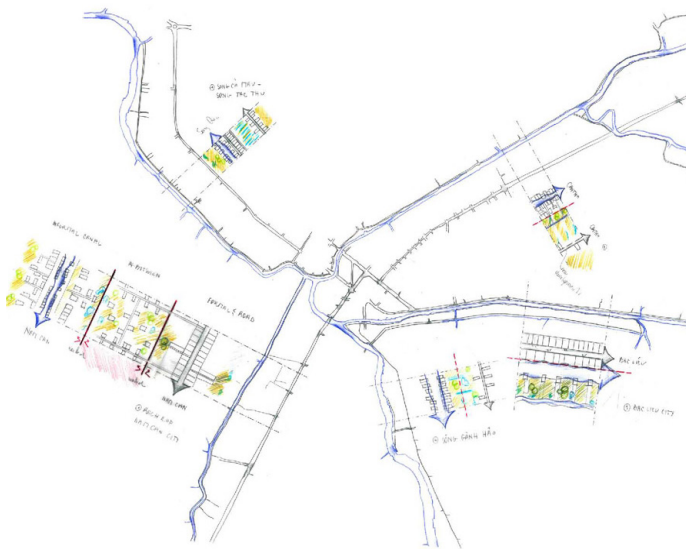
New urban quarters

Lisa Meulemans
(Bernadette Gordijn)

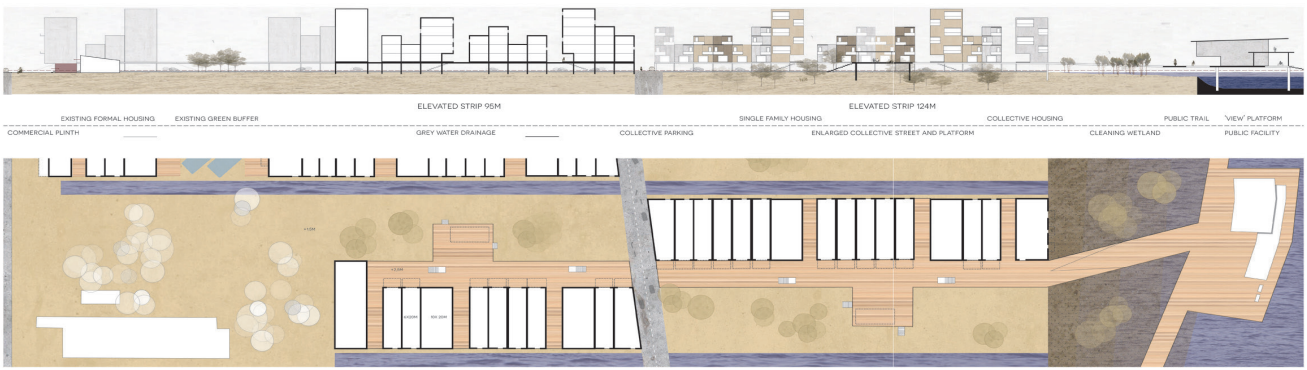
As the populaton of Cà Mau is expected to double shortly and as the general level of the investment capacity of the households is also growing radically, a quest araises for the prompt realisation of innovative residential areas, that answer to the future social consumption norms. The expectations are indeed very high. The extension of the residential stock evidently should be sustainable and density is surely also on the agenda. Above all however,, Cà Mau is, topographically speaking, one of the lowest cities of the world. aIt's vulnerability to climate change (amongst others flooding) is paramount.
Obviously a hyperurbanism is required in this hyperlandscape. Any extension of impervious surfaces should definetly go hand in hand with addition of permeable or water retention capacity.
.
The current masterplan of 2010 shifts Cà Mau from a city at the confluences of rivers and canals into a 'packed' city. This projects proposes to start from the existing (road and water based) armatures. It revalues this armatures and reactivates the dialogue between them. The water armatures regain preeminance. Lateral systems are introduced between the water and road armatures to structure the new urban fabric in between. Consequently, the quarters that are mainly captured by the armatures find there antonym in a juxtaposed hyperlandscape.
The new quarters function, given there location, simultaniously as gates and announce, in the middle of the majestic Ca Mau peninsula, Cà Mau city..







ACTUAL SITUATION AND STRATEGY FOR THE NEW RESIDENTIAL QUARTERS



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